APPENDIX M
CULTURAL RESOURCES ASSESSMENT

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CULTURAL RESOURCES ASSESSMENT
BASIS OF DESIGN REPORT
JORGENSEN FORGE EARLY ACTION AREA

Prepared for

U.S. Environmental Protection Agency
Region 10
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On behalf of

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Prepared by

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March 2013

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
Action Memo	*Action Memorandum for a Non-Time-Critical Removal Action at the Jorgensen Forge Early Action Area of the Lower Duwamish Waterway Superfund Site in Seattle, Washington*
AOC	Administrative Order On Consent
APE	Area of Potential Effects
ARAR	applicable or relevant and appropriate requirement
BODR	Basis of Design Report
BP	before present
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRA	Cultural Resources Assessment
cy	Cubic yards
EE/CA	Engineering Evaluation/Cost Analysis
EMJ	Earle M. Jorgensen Company
EPA	U.S. Environmental Protection Agency
Facility	Jorgensen Forge facility
fbs	feet below surface
Jorgensen Forge	Jorgensen Forge Corporation
Jorgensen Forge EAA	Jorgensen Forge Early Action Area
LDW	Lower Duwamish Waterway
Navy	U.S. Department of Navy
NRHP	National Register of Historic Places
NTCRA	non-time-critical removal action
PCB	polychlorinated biphenyl
RM	River Mile
RvAL	PCB removal action level
SHPO	State Historic Preservation Office
SOW	Statement of Work

1 INTRODUCTION

This Cultural Resources Assessment (CRA) has been prepared on behalf of Earle M. Jorgensen Company (EMJ) and Jorgensen Forge Corporation (Jorgensen Forge; herein referred to collectively as the Owner) pursuant to the Administrative Settlement Agreement and Order on Consent for Removal Action Implementation (AOC; U.S. Environmental Protection Agency [EPA] Region X Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] Docket No. 10-2012-0032) and attached Statement of Work (SOW). This CRA is an appendix to the Basis of Design Report (BODR) Final Design submittal for the cleanup of contaminated sediments and associated bank soils in a portion of the Lower Duwamish Waterway (LDW) Superfund Site adjacent to the Jorgensen Forge facility (Facility) located in Tukwila, King County, Washington (see Figure 1; Jorgensen Forge Early Action Area [EAA]). The cleanup will be conducted as a non-time-critical removal action (NTCRA) in accordance with EPA's selected cleanup alternative documented in the *Action Memorandum for a Non-Time-Critical Removal Action at the Jorgensen Forge Early Action Area of the Lower Duwamish Waterway Superfund Site in Seattle, Washington* (Action Memo; EPA 2011) and detailed in the *Final Engineering Evaluation/Cost Analysis [EE/CA]– Jorgensen Forge Facility, 8531 East Marginal Way South, Seattle, Washington* (Anchor QEA 2011).

1.1 Project Description

The 1.6-acre Jorgensen Forge EAA is located in the LDW Superfund Site in Seattle, Washington at approximately River Mile (RM) 3.6 adjacent to a portion of the Jorgensen Forge facility located at 8531 East Marginal Way South (Figure 1). The removal action selected for the Jorgensen Forge EAA by EPA includes cleanup extending from the navigation channel to the top of the shoreline bank and abutting sheetpile and concrete panel walls. Under an AOC, EPA is requiring the Owner, to implement the sediment and bank cleanup due to elevated chemical concentrations (primarily polychlorinated biphenyls [PCBs]). Construction activities planned as part of the cleanup include removing approximately 10,800 cubic yards (cy) of material, placing approximately 7,900 cy of backfill and 7,600 cy of shoreline materials, reconfiguring the shoreline bank, and transport and off-site disposal of impacted sediments and soils.

The EPA-approved removal action in the EAA includes the removal of the complete lateral and vertical extents of sediments within the EAA containing chemical concentrations above the identified PCB removal action level (RvAL) followed by the placement of clean backfill, and reconfiguration and containment of the shoreline bank. EPA is requiring the in-water removal to be conducted using a barge-mounted precision excavator (hydraulic closing bucket where implementable). To the extent feasible, the bank removal and containment should be conducted in-the-dry, based on tidal conditions during the construction period. The removed sediment, soil, armor, and debris (including a few derelict pilings) will either be transported to a temporary offloading facility constructed on a portion of the Jorgensen Forge property or at a permitted off-site offloading facility on the LDW. The offloaded materials will then be transported and disposed of at an off-site non-hazardous Subtitle D commercial disposal facility.

1.2 Regulatory Context and Purpose

For this removal action, EPA must substantively comply with Section 106 and its implementing regulations at 36 CFR 800. CERCLA Section 121(e)(1) provides that no federal, state, or local permits are required for remedial activities conducted entirely on site. However, this does not remove the requirement to meet (or waive) the substantive provisions of permitting regulations that are applicable or relevant and appropriate requirements (ARARs). Section 106 is an ARAR for this removal action. Section 106 requires federal agencies to consider the effects of their undertakings on historic properties listed in (or eligible for listing in) the National Register of Historic Places (NRHP). Thirty-six CFR 800 describes a five-step process for implementing Section 106:

1. Consult with the State Historic Preservation Officer (SHPO), interested and affected Indian Tribes, interested parties, and the public;
2. Determine the undertaking's Area of Potential Effects (APE);
3. Determine whether potential historic properties are present in the APE;
4. Evaluate whether the properties are NRHP-eligible, and if so, whether the project will affect them; and
5. Mitigate adverse effects to NRHP-eligible historic properties.

The purpose of this CRA is to assist EPA in complying with Section 106 and 36 CFR 800 by describing the APE, describing known and potential historic properties in the APE, and recommending NRHP eligibility and project effects.

1.3 Area of Potential Effects

The removal action does not include demolition or modification of existing structures, or changes to the character of the landscape. The pilings that will be removed are derelict and no longer form a standing structure. Therefore, there are no potential effects to the built environment. The APE is the area where direct and indirect effects to archaeological properties may occur as a result of ground disturbance (Figure 2).

Ground disturbance will occur during the removal of contaminated sediments in the LDW and adjacent shoreline bank. Removal will occur in the removal action boundary (RAB) shown on Figure 3. Depth of excavation is shown on Figures 4 and 5. Staging and stockpiling will occur on existing prepared surfaces.

1.4 Document Organization

This Cultural Resources Report has been organized into the following sections:

- Section 2 – Environmental and Cultural Context. This section describes the environmental setting and cultural history of the LDW in the vicinity of the removal action, as well as previous archaeological research.
- Section 3 – Methods and Results. This section describes how the removal action's potential to affect historic properties was assessed, and the results of the assessment.
- Section 4 – Recommendations. This section includes recommendations for EPA's Section 106 determinations.

2 ENVIRONMENTAL AND CULTURAL CONTEXT

2.1 Environmental Context

The project vicinity is in the Puget Trough physiographic province, a valley system that extends from Puget Sound south through the Willamette Valley and that separates the Olympic Mountains from the Western Cascades (Franklin and Dyrness 1973). During the last glacial advance, the Vashon Stade of the Late Wisconsin glaciation, glaciers extended as far as Centralia, 85 miles south of Seattle. Glaciers began to recede about 15,000 years ago, leaving behind a rapidly changing landscape of proglacial lakes, meltwater streams, and other alluvial features. This process created the Vashon till, which is the thick layer of Pleistocene glacial outwash underlying Holocene sediments in the project vicinity. As the glaciers retreated, land formerly depressed by the weight of the ice began to rebound, a process of uplift that lasted until approximately 9,000 years ago (Dragovich et al. 1994).

The project area was deeply subtidal—part of an embayment that extended south as far as present-day Auburn—until the Duwamish River delta began to aggrade about 5,700 years ago after a large eruption of Mount Rainier. The eruption created the Osceola mudflow, which introduced massive amounts of sediment into the Duwamish River drainage and caused the river mouth to move northward as the river valley filled with sediment (Dragovich et al. 1994). The Duwamish River delta was near its historic location by 1,500 to 2,200 years ago, at which time, it would have been available for use as a gathering location for local Native American communities. An earthquake that occurred around 1,050 years ago further uplifted the lower Duwamish River area, raising the terraces adjacent to the river mouth (Updegrave 2007; Miss et al. 2008). The Duwamish River mouth at historic contact meandered through low-lying areas surrounded by higher terraces (Figure 6).

Native vegetation in the Puget Sound area consists of forests of the *Tsuga heterophylla* zone, which is characterized by western hemlock, western red cedar, and Douglas fir, with a dense shrub and herbaceous understory including sword fern, salal, Oregon grape, ocean spray, blackberry, red huckleberry, and red elderberry (Franklin and Dyrness 1973). After the Duwamish River attained its late precontact and historic location, the river mouth area would have been a productive salt marsh environment at the forest edge, attractive for resource procurement and settlement.

2.2 Cultural Context

The Manis mastodon site on the Olympic Peninsula near Sequim, which has been radiocarbon dated to about 12,000 before present (BP; Gustafson and Manis 1984), may be the earliest evidence for prehistoric human occupation in Western Washington. There are few other sites that date before about 5000 BP. Numerous sites have been identified across the region dating to the period after 5000 BP, when larger populations began to organize in more complex ways to exploit a wide range of resources, including salmon and shellfish, land mammals, and plant resources such as berries, roots, and bulbs (Matson and Coupland 1995:97). Over time, populations accumulated in large, semi-sedentary cedar plank house villages located at river mouths and confluences and on protected shorelines. The artifact tool kits became increasingly complex and specialized, allowing for large takes of resources, which were processed and stored for year-long consumption (Ames and Maschner 1999).

The project area is in the traditional territory of the Duwamish, a Southern Coast Salish group speaking the Southern Lushootseed language, who lived in villages from Lake Washington to the Black River (Suttles and Lane 1990:485). More than 12,000 Lushootseed speakers occupied the Puget Sound region prior to European contact; however, epidemics introduced by the newcomers reduced this population to only 5,000 by the 1850s (Suttles and Lane 1990:501).

Southern Coast Salish villages were occupied part of the year, largely in winter, and residents made seasonal journeys to camps near resource gathering areas. Coastal villages relied on fish (Suttles and Lane 1990), which they caught with various weirs and traps, as well as shellfish and sea mammals (Ruby and Brown 1986). These food sources were supplemented by various berries, roots, and bulbs (Suttles and Lane 1990; Ruby and Brown 1986:166).

(b)(3)

(b)(3)

(b)(3)

(b)(3)

before. By the late 1850s, many Duwamish had moved to newly-established reservations, though some families remained.

Captain George Vancouver's 1792 exploration of Puget Sound marked the first Euroamerican intrusion in the region (Kirk and Alexander 1990:271). However, Euroamerican settlement in the region was not established until 1832; the earliest instance was at Fort Nisqually at the southern end of Puget Sound. The Wilkes Expedition of 1841 used the fort as a base for explorations in southern Puget Sound, which included mapping in proximity to the project area (Kirk and Alexander 1990:308).

Lumber was Puget Sound's major export for much of its early history; in fact, Washington was the number one lumber-producing state in 1910, with 63 percent of the state's wageworkers dependent upon the forest products industry for jobs (Schwantes 1996:215). Many of the mill towns in Puget Sound were established after the devastating San Francisco

fires of 1852. Virgin timber stands and natural deepwater anchorages provided ships refuge from the Pacific storms. Soon, inlets up and down Puget Sound were exporting timber down the coast (Schwantes 1996:217).

Early industries depended on navigable waterways, and Euroamerican settlers soon began altering the natural environment to promote the movement of goods. Between 1900 and 1920, a number of dredging projects straightened the course of the Lower Duwamish River (now the LDW) and built Harbor Island (Wilma 2001a, 2001b). The South Park and Georgetown areas hosted vegetable and dairy farms that supplied the Seattle area. South Park was incorporated in 1902, and was annexed to Seattle 5 years later. After annexation and the creation of the Duwamish Waterway, South Park became increasingly industrial (Wilma 2001c). Georgetown, where the APE is now located, was platted in 1871, named in 1901, and annexed to Seattle in 1910 (Wilma 2001d). It was known as a red-light district of saloons—not to mention what would become the Rainier Brewery—prior to industrialization.

The land that became the Jorgensen Forge property became waterfront property when the LDW was constructed. A small embayment appears on early photos (Figure 8), but the reason the embayment was constructed is unknown. The Jorgensen Forge property was transferred from (b) (6) to King County in 1916. King County held it for 3 years, transferring it to the Seattle Trust Company in 1919. The next year, the Seattle Trust Company transferred the property back to (b) (6) In 1940 and 1941, King County transferred the property in three portions to Joe (Guiseppe) Desimone. Until this time, the parcel was in agricultural use, as shown on Figure 8. In 1942, Isaacson Iron Works signed a contract with the U.S. Department of Navy (Navy) to acquire the Jorgensen Forge property and build infrastructure to be owned by the Navy; Isaacson Iron Works purchased most of the property from Desimone shortly thereafter. The property has been owned by various industrial entities from that time until the present.

A 1944 photo shows industrial infrastructure in construction, and the small embayment squared off and armored (Figure 9). A rail trestle runs across the mouth of the embayment and it seems to have been removed after filling was completed. A 1946 photo shows almost the entire property occupied by industrial infrastructure, the embayment filled, and the

shoreline armored (Figure 10). The Jorgensen Forge property has been almost completely occupied by industrial buildings since the 1940s.

2.3 Previous Research

There are no recorded archaeological sites in the APE. Four sites have been recorded within a mile of the APE. Three are precontact sites (b)(3)

(b)(3)

No previous cultural resources surveys have been conducted in the APE. Seven cultural resources surveys have been conducted within a mile of the APE (Table 1).

Table 1

Previous Cultural Resources Surveys within a Mile of the APE

Reference	Title	Cultural Resources Located	Notes
Cole 2001	*Heritage Resources Survey of the South Park Cell Tower*	None	
Roedel 2001	*Archaeological Resources Monitoring for the South Park Bridge Project*	None	Historical debris observed in fill, recommended not significant
Historical Research Associates 2004	*South Park Bridge Project Cultural and Historical Resources Technical Report*	None	Pre-fieldwork alternatives analysis
Gilpin 2006	*Archaeological Monitoring at 9229 E. Marginal Way, Tukwila*	None	Historical debris observed in fill, recommended not significant
ENTRIX and BOAS, Inc. 2008	(b)(3)	(b)(3)	
Zuccotti et al. 2008	*Cultural Resources Section 106 Technical Report, Georgetown Steam Plant Flume Project – DAHP Log No. 030408 – EPA Slip 4 Early Action Area, Lower Duwamish Waterway Superfund Site, Seattle, WA*	No archaeological materials; historical buildings recorded	
Foutch et al. 2009	*Cultural Resources Study for the SR 99 Intelligent Transportation System Improvements Project*	None	Archaeological monitoring recommended.

Only one of the surveys (ENTRIX and BOAS, Inc. 2008) located archaeological resources; this investigation for the South Park Bridge Project recorded (b)(3) [redacted].

2.4 Archaeological Expectations

Located just inside a meander of the former Lower Duwamish River, and at (or near) an ethnographically-named place, the vicinity of the Jorgensen Forge property has high potential for precontact or early historic Native American archaeological materials. Any such materials, in intact context, are likely to be significant and NRHP-eligible. These materials would only be expected in intact or minimally disturbed native sediments.

Previous subsurface testing and monitoring at nearby locations along the LDW has revealed that scattered historic artifacts are common in artificial fill in the LDW area (Roedel 2001; Gilpin 2006). It is likely that industrial debris such as fragments of brick, metal, glass, and tile, is present in fill in the APE. These materials are unlikely to yield information important to the study of history, and are unlikely to be NRHP-eligible. Historic artifacts would be eligible only if found in a feature that can be associated with a particular use, time period, or community. The history of the Jorgensen Forge property does not indicate a high likelihood of this type of feature.

3 METHODS AND RESULTS

3.1 Methods

Potential effects to historic properties were determined by comparing the ground-disturbing project elements to direct and indirect evidence of landform history to determine if there was potential to encounter unrecorded archaeological resources. Ground-disturbing project elements include dredging in the LDW (in the in-water portion of the RAB), and removal of shoreline bank sediments adjacent to the waterway to a maximum depth of 4 feet below ground surface (fbs).

3.2 Results

3.2.1 Information from Maps and Aerial Photographs

There are two distinct landform histories in the APE: the LDW and the upland areas. Early maps of the area (see Figures 6 and 7) show the entire APE as a low terrace west of the Lower Duwamish River and east of an abandoned meander. The histories diverge at the creation of the LDW in the first decades of the twentieth century.

In the in-water portion of the APE, the LDW was dug into sediments that had rapidly aggraded in an underwater setting as the Duwamish River Delta moved north into Elliot Bay in the late Holocene. Dredging maps on file at the Port of Seattle show that the LDW in front of the Jorgensen Forge property has been dredged on average every 3 to 4 years since 1945 (and likely many times before 1945). The most recent maintenance dredging occurred in 2003.

In the upland portion of the Jorgensen Forge property, at or shortly after creation of the LDW, a small embayment was identified. The property was in agricultural production until the 1940s. The "plow zone," which constitutes the upper 18 inches (45 centimeters) bgs, were likely disturbed. Some clearing or leveling may also have taken place. By the early 1940s, industrial infrastructure was being built on the property. The embayment was filled, and additional filling took place along the shoreline. Aerial photos (Figures 8 though 10) illustrate this progression, and Figure 11 shows the likely location of the pre-industrial shoreline of the LDW.

3.2.2 Geotechnical Data

Considerable geotechnical investigation has been conducted at the property. Seven borings were obtained just landward of the area of planned shoreline bank ground disturbance. Appendix A contains geotechnical bore logs for these cores, and locations are shown on Figure 11. The logs show thick fill across the site, as deep as 16 feet in some areas. Boring SB-7 shows that the fill from 12.5-16 fbs contains "brick throughout," and several other bore logs mention brick or "white brick." Boring SB-2 includes "cobble and black obsidian-like material" in fill between 6 and 8 fbs. Similar material is also described in Boring SB-3 at 2 fbs. Given the presence of the rail trestle in 1944, the black material could be "clinker" or slag, a by-product of industrial processes. Clinker is commonly found in railroad ballast and other industrial fills.

Only one boring contained possible native sediments. Boring SB-6 showed sand with trace silt between 15.5 and 16.5 fbs. The sand was wet, which is consistent with the water level in the nearby LDW.

3.2.3 Ground-disturbing Project Elements and Archaeological Potential

In-water (subtidal) ground disturbance will occur at the nearshore areas of the RAB. Because the LDW is a recently-created feature dug into alluvial sediments that accumulated underwater, and has been dredged many times in the past, dredging of the channel bottom has little to no potential to encounter precontact or historic archaeological resources.

Ground disturbance will also occur in shoreline bank areas in the RAB. Of these, only the furthest northwest shoreline area is landward of the former LDW shoreline (prior to filling of the embayment and shoreline in the early 1940s). Geotechnical core SB-1 just landward of this northwest corner shows 9.5 feet (2.9 meters) of fill in the area. The other cores show between 8 and 16 feet of fill. Ground disturbance for the project will not exceed 4 feet, and therefore will not encounter native sediments. Therefore, shoreline bank work has no potential to encounter intact precontact archaeological resources.

Upland borings logs show a variety of historic materials in the fill; primarily brick and sawdust, but also other industrial waste. These materials are unlikely to represent discrete

features for three reasons: 1) materials are distributed throughout thick fill layers, a pattern more characteristic of opportunistic filling with demolition debris and other disturbed sediments than a buried feature; 2) aerial photographs spaced closely in time show no potentially significant features at the shoreline during the period of filling; and 3) historic debris in fill layers in the LDW area has not generally met the threshold for significance (Roedel 2001; Gilpin 2006). Therefore, while the upland sediments certainly contain historic-era materials dating to filling in the 1910s to 1940s, these materials are unlikely to be significant.

Remnants of pilings that once supported the 1944 rail trestle are visible at the surface. The trestle clearly existed for only a short time; no information is available about its function, construction, or significance in the development of the property. Further, the majority of the trestle is gone, and the pilings are deteriorating. It clearly lacks integrity – the ability to convey its historic significance. The pilings are recommended not NRHP-eligible.

4 RECOMMENDATIONS

The Jorgensen Forge EAA removal action has little to no potential to disturb NRHP-eligible historic properties from the precontact or historic eras. It is recommended that EPA determine that **no historic properties will be affected** by the removal action.

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FIGURES

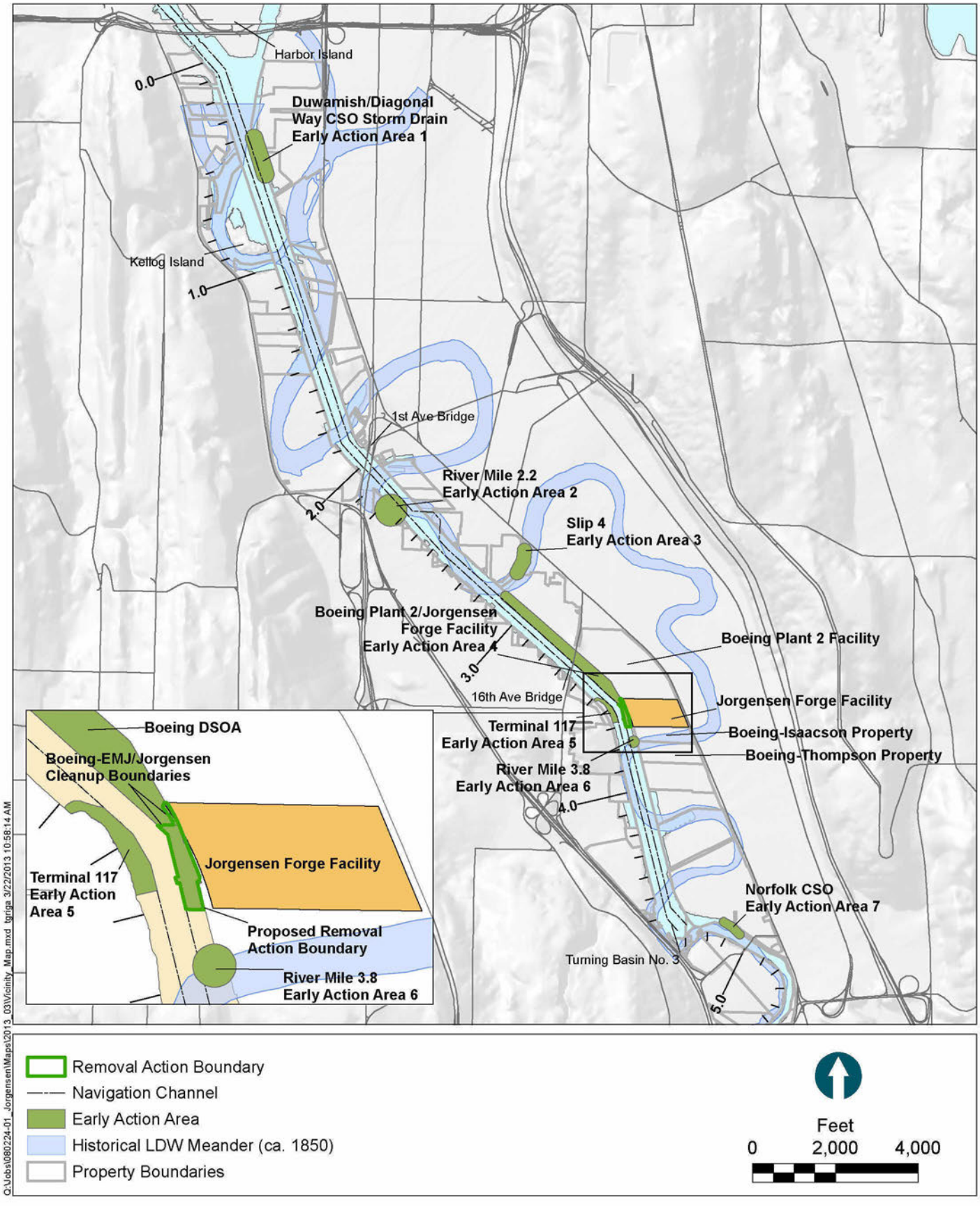


Figure 1
Project Vicinity
Water Quality Monitoring Plan
Jorgensen Forge Early Action Area Removal Action

ANCHOR QEA

EMJ015534

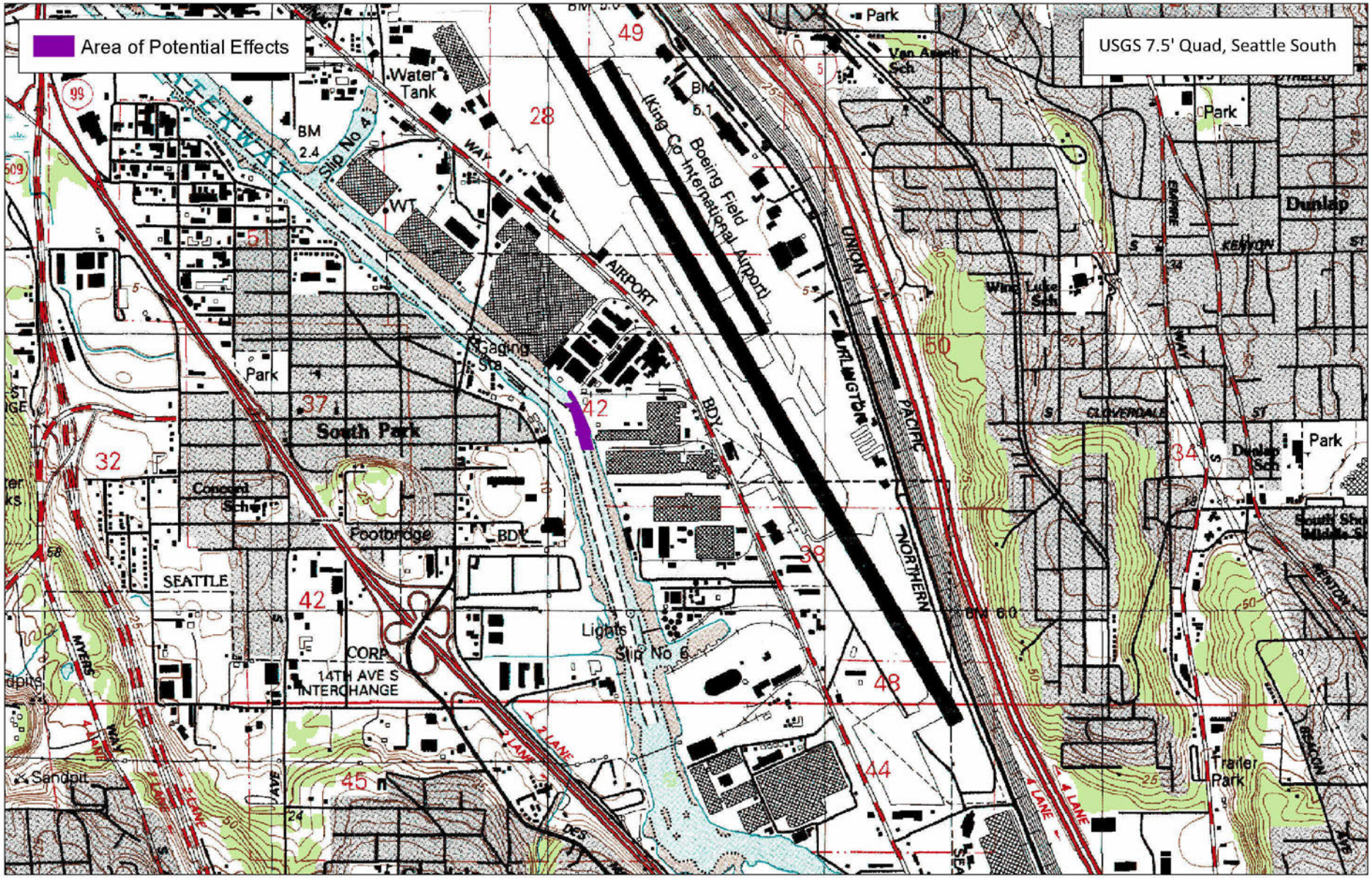
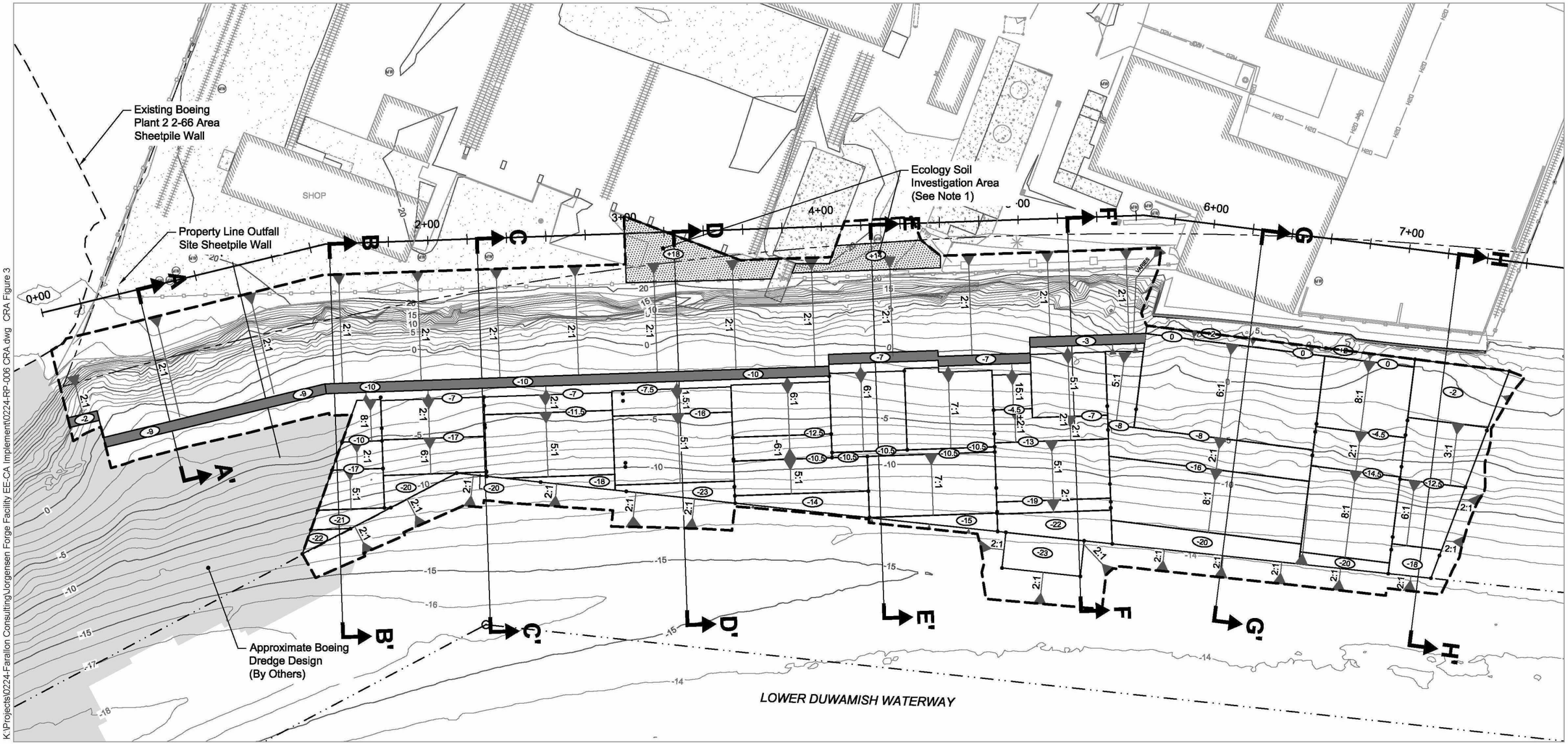


Figure 2
Area of Potential Effects
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

EMJ015535



K:\Projects\0224-Farallon Consulting\Jorgensen Forge Facility EE-CA Implement\0224-RP-006 CRA.dwg CRA Figure 3

Mar 22, 2013 10:56am tgriga

HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).
NOTES:

1. The Owner is removing additional soil and backfilling along the top of bank area surrounding soil borings SB-3 and SB-4 to remove relatively elevated concentrations of polychlorinated biphenyls. This work is not being performed under the EPA scope of work but rather as an Independent Action under the existing Ecology Agreed Order (No. DE 4127) at the facility.

LEGEND:

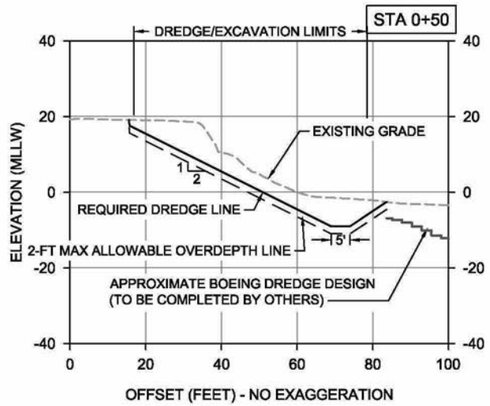
- Navigation Channel
- Existing Contour (1 Ft Interval)
- Dredge/excavation Limits
- Existing Monitoring Well
- Required Dredge Elevation (ft Mllw)
- Top Of Sideslope
- Final Grade
- Dredge Coordinate
- Dredge Boundary
- Slope Arrow
- Toe Trench To Be Constructed At Base of 2H:1V Bank Dredge/Excavation Slope

0 60
Scale in Feet

ANCHOR QEA

Figure 3
Proposed Action Site Plan
Cultural Resources Assessment
Jorgenson Forge Early Action Area Removal Action

EMJ015536



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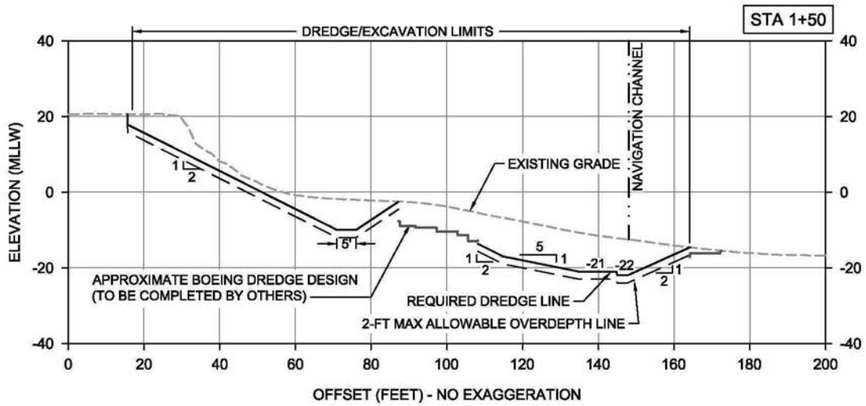
SCALE:1" = 40'



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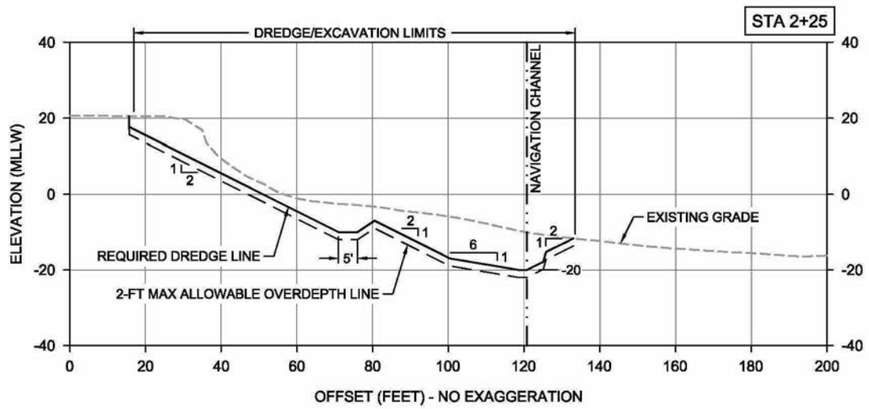
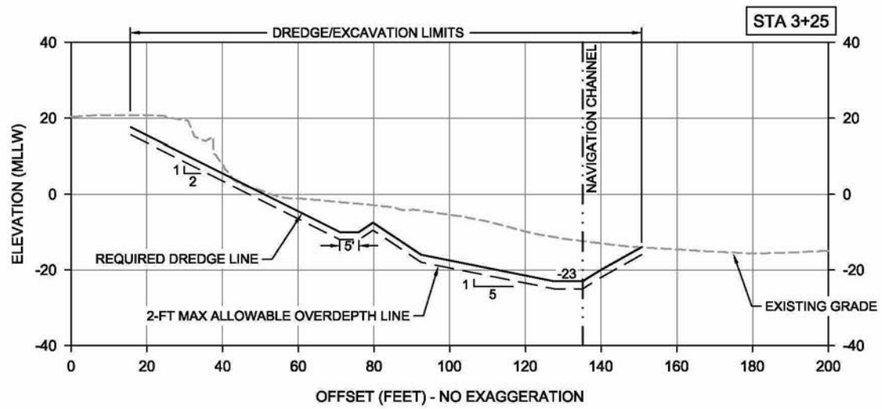


3 - DREDGE/EXCAVATION SECTION C-C'
SCALE:1" = 40'



4 - DREDGE/EXCAVATION SECTION D-D'
SCALE:1" = 40'

HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTES:

1. Existing grade is a merge of upland survey by PLS, Inc. on January 24, 2012, bathymetric survey by eTrac on February 8, 2012, and additional bank survey by AEC Consultants, inc on February 21, 2012.

LEGEND:

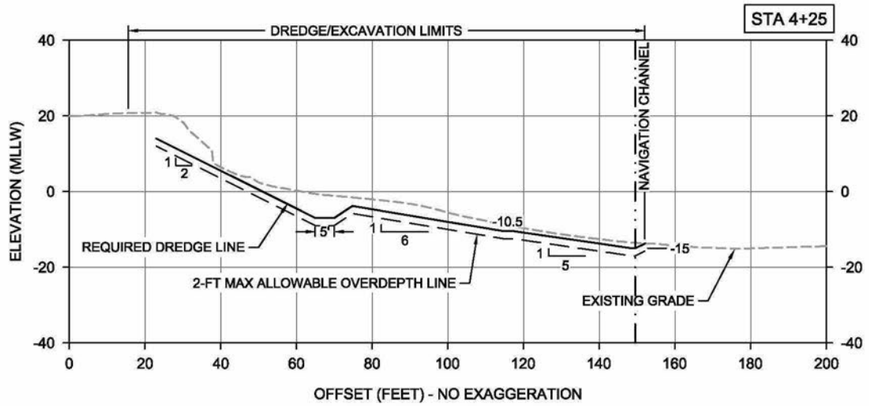
- Existing Grade
- Required Dredge Line
- 1-ft Payable Overdepth Line

0 40
Scale in Feet

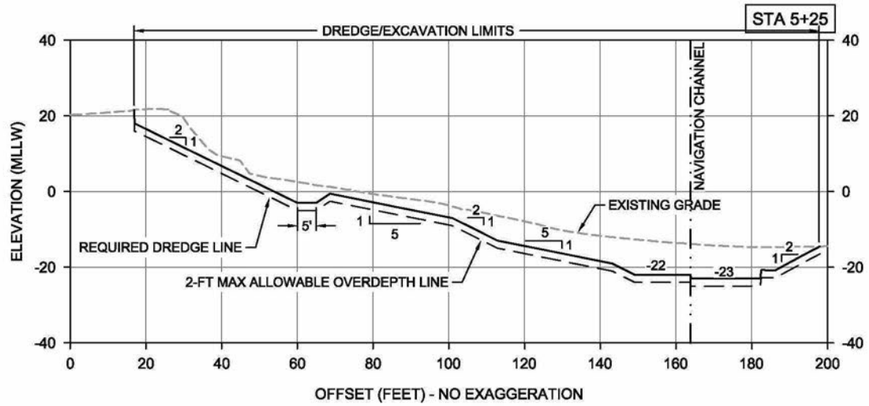
ANCHOR QEA

Figure 4
Project Cross-Sections A-A' to D-D'
Cultural Resources Assessment
Jorgenson Forge Early Action Area Removal Action

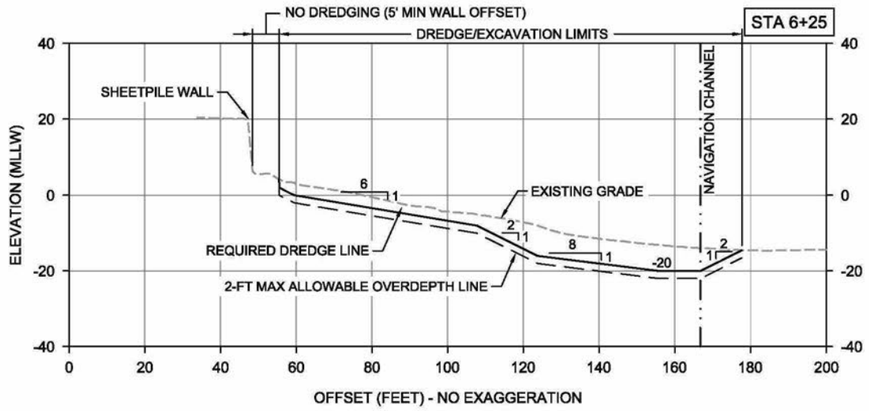
EMJ015537



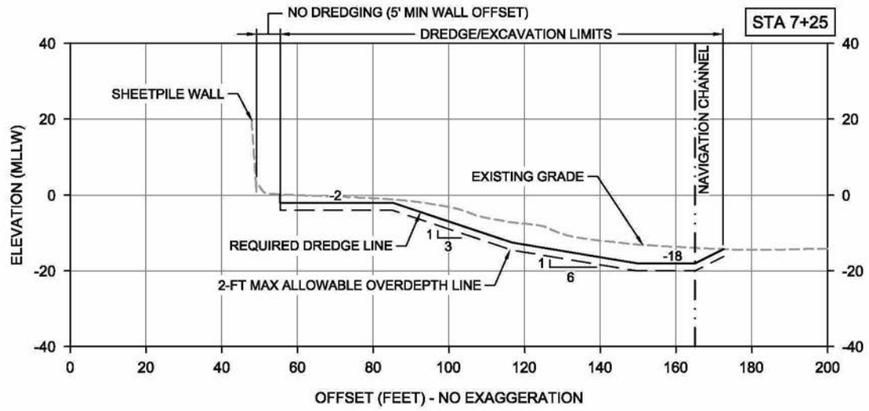
5 DREDGE/EXCAVATION SECTION E-E'
SCALE:1" = 40'



6 DREDGE/EXCAVATION SECTION F-F'
SCALE:1" = 40'



7 DREDGE/EXCAVATION SECTION G-G'
SCALE:1" = 40'



8 DREDGE/EXCAVATION SECTION H-H'
SCALE:1" = 40'

HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.
VERTICAL DATUM: Mean Lower Low Water (MLLW).

NOTES:

1. Existing grade is a merge of upland survey by PLS, Inc. on January 24, 2012, bathymetric survey by eTrac on February 8, 2012, and additional bank survey by AEC Consultants, inc on February 21, 2012.

LEGEND:

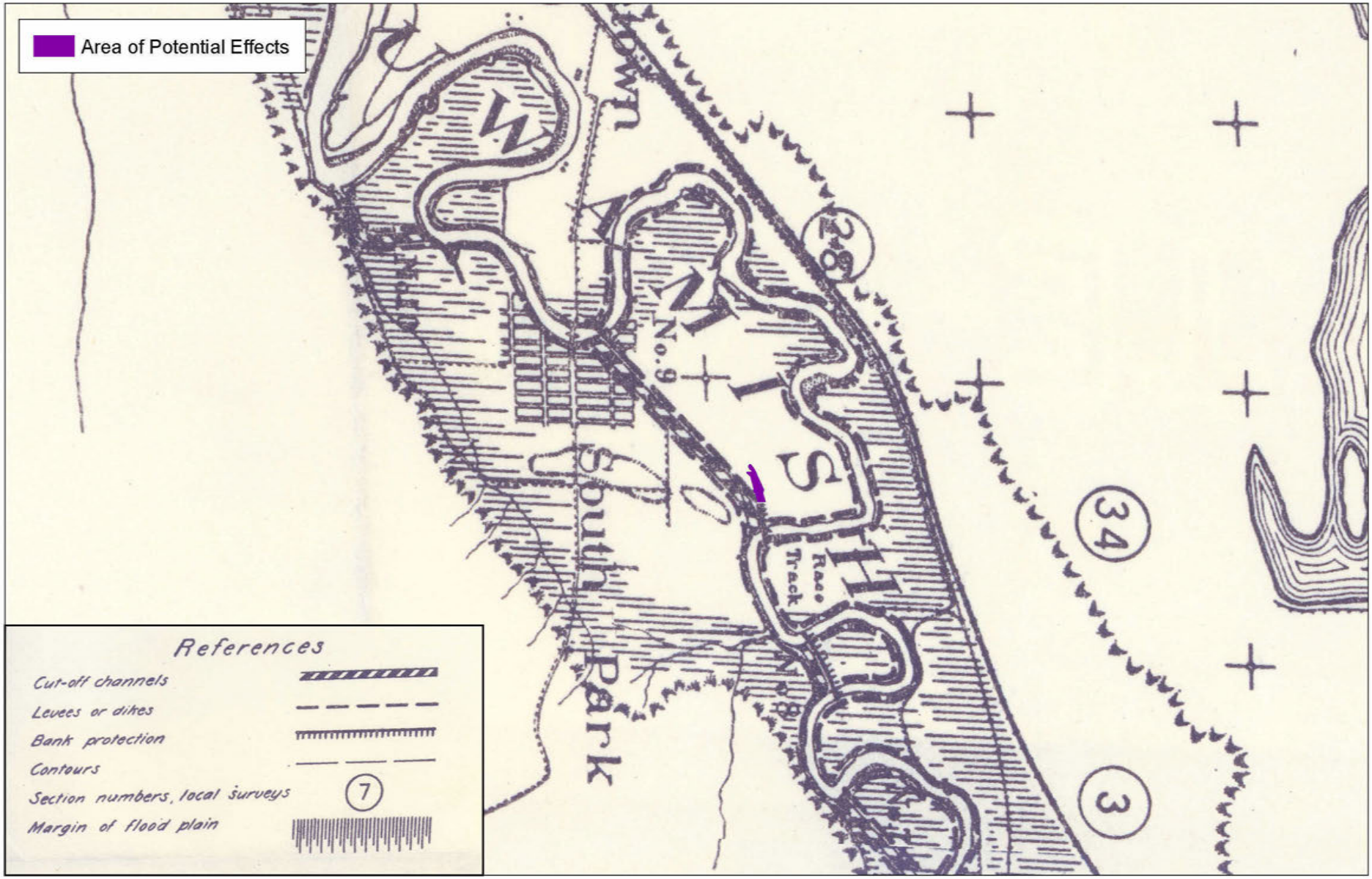
- Existing Grade
- Required Dredge Line
- 1-ft Payable Overdepth Line

0 40
Scale in Feet

ANCHOR QEA

Figure 5
Project Cross-Sections E-E' to H-H'
Cultural Resources Assessment
Jorgenson Forge Early Action Area Removal Action

EMJ015538



ANCHOR QEA

Feet
0 1,500 3,000

Figure 6
Map of the Duwamish River from Keilland 1907
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

EMJ015539

ANCHOR QEA

Feet
0 1,500 3,000

Figure 7
Ethnographic Place Names from Waterman (1922)
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

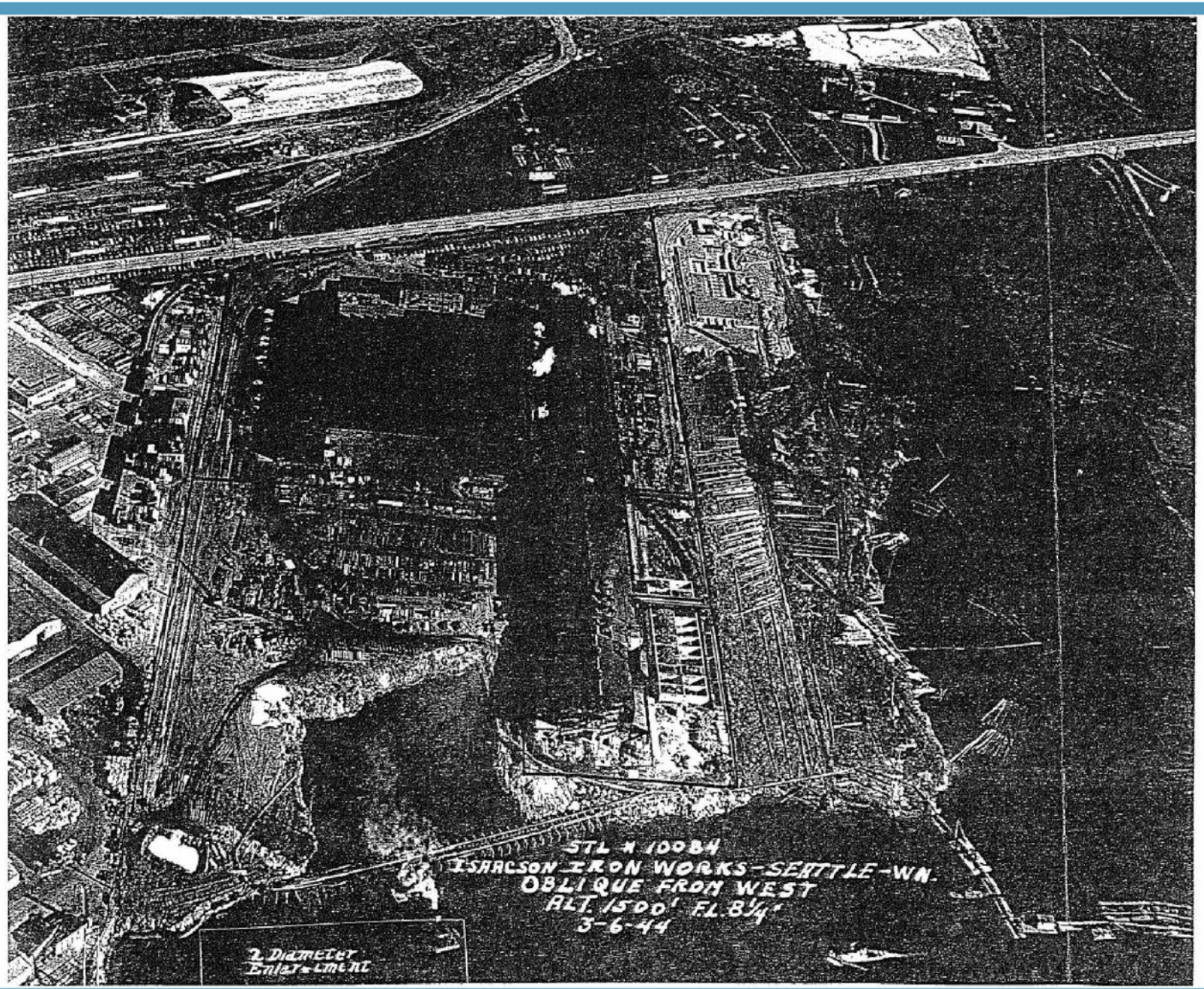
EMJ015540

ANCHOR QEA

Feet
0 250 500

Figure 8
1940 Aerial Photo
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

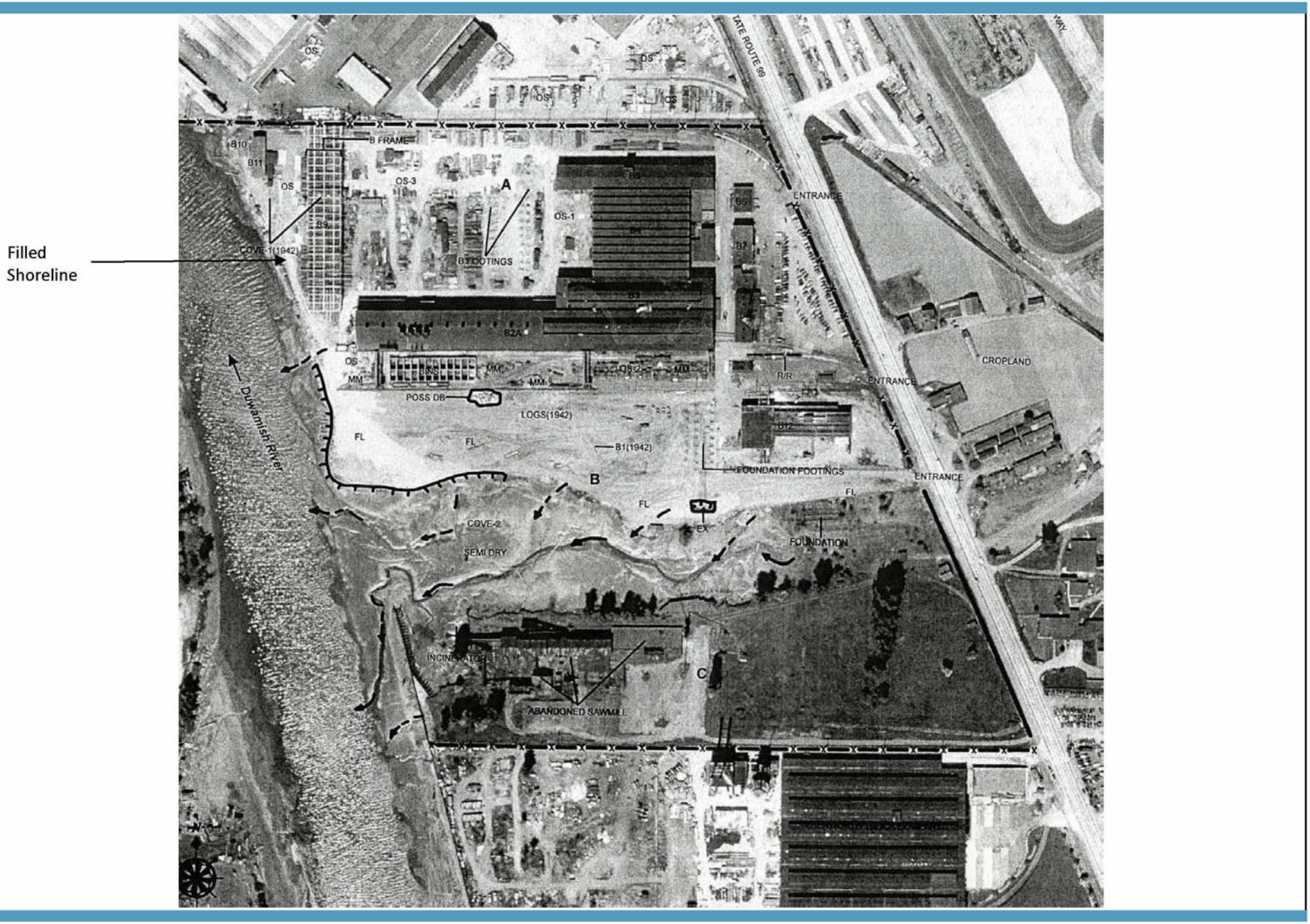
EMJ015541



ANCHOR QEA

Figure 9
1944 Oblique Aerial Photo
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

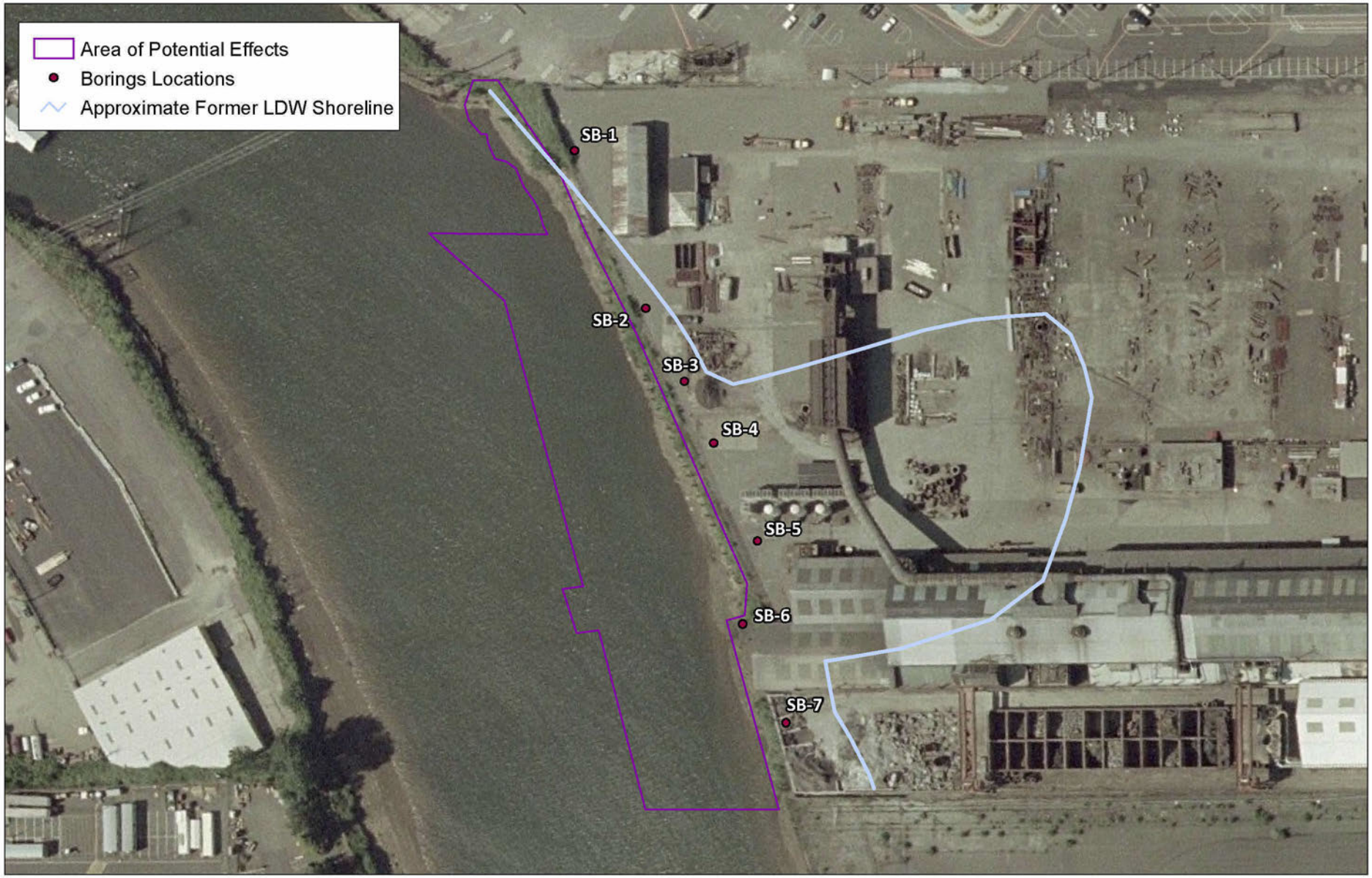
EMJ015542



ANCHOR QEA

Figure 10
1946 Aerial Photo
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

EMJ015543



ANCHOR QEA

Feet
0 75 150

Figure 11
Borings Relative to APE and Former Shoreline
Cultural Resources Assessment
Jorgensen Forge Early Action Area Removal Action

EMJ015544

ATTACHMENT 1
GEOTECHNICAL BORE LOGS

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-1

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	8/26/04 0850	**Sampler Type:**	4-foot sampler
Date/Time Completed:	8/26/04 0915	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	12
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	12
Drilling Foreman:	Kasey Goble	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL with silt minor sand. 65% fine-coarse gravel, 20% silt, 15% fine sand. Brown, moist, no odor.			50	NA	NA	082604-0850-01	X	
		FILL--GRAVEL minor sand trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, and 5% silt. Brown, moist, no odor. White brick material at 3 feet bgs.			50	NA	NA	082604-0855-02	X	Well not installed
		FILL--Silty GRAVEL with sand. 45% fine-coarse gravel, 40% silt, and 15% fine-coarse fine-course sand. Brown, moist, no odor.			50	NA	NA	082604-0900-03	X	
5		FILL--SAND trace silt. 95% fine-coarse sand, 5% silt. Brown, moist, no odor.			50	NA	NA	082604-0902-04	X	
					50	NA	NA	082604-0910-05	X	
10		SILT. 100% silt. Grey with orange mottling, moist, no-odor.	MH		60	NA	NA	0826-04-0915-06	X	
		SAME wet								
15										
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 14-feet
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: **X:** 122.30894 **Y:** 47.52696

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-2

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	08/26/04 0940	**Sampler Type:**	4-foot sampler
Date/Time Completed:	08/26/04 1020	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	14
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Kasey Goble	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL minor sand trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, 5% silt. Brown. moist, no odor.			40	NA	NA	082604-0940-07	X	
					40	NA	NA	082604-0943-08	X	Well not installed
		FILL--SAME with marbeling			50	NA	NA	082604-0945-09	X	
5		FILL-SAME with cobble and black obsidion like material			70	NA	NA	082604-0952-10	X	
		FILL--Gravel with sand trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, and 5% silt. Marbeled brown, moist, no odor.			50	NA	NA	082604-0956-11	X	
10		FILL--White brick			50	NA	NA	082604-1000-12	X	
		FILL--SAND minor gravel minor silt. 75% fine-coarse sand, 15% coarse gravel, 10% silt. Grey, moist, no odor.			50	NA	NA	082604-1012-13	X	
		FILL--SAND. 100% fine-coarse sand. Grey, moist, no odor, very dense.								
		SAME but not very dense.			60	NA	NA	082604-1020-14	X	
15		FILL--SAND with gravel. 65% fine-coarse sand and 35% fine-coarse gravel. Grey, wet, no odor								
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 14-feet
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: **X:** 122.30818 **Y:** 47.52657

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-3

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	08/26/04 1055	**Sampler Type:**	4-foot sampler
Date/Time Completed:	08/26/04 1300	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	NE
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	10
Drilling Foreman:	Kasey Goble	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL with sand minor silt. 65% fine-coarse gravel, 20% fine-coarse sand, 15% silt. Brown, moist, no odor.			50	NA	NA	082604-1105-15	X	
		FILL--GRAVEL with sand trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, 5% silt. Brown, moist, no odor. Black obsidion like material at 2 feet.			60	NA	NA	082604-1106-16	X	Well not installed
		FILL--GRAVEL minor sand. 90% fine-coarse gravel and 10% fine-coarse sand. Marbeled brown, moist, no odor.			50	NA	NA	082604-1109-17	X	
5		FILL--GRAVEL with sand trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, 5% silt. Brown/orange, moist, no odor.			65	NA	NA	082604-1118-18 082604-1240-19	X	
		REFUSAL--move one foot north/			50	NA	NA	082604-1246-20	X	
		SAME as 6'-8'								
10		REFUSAL move one foot north, sampler breaks inside boring.			0	NA	NA			
15										
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 15-feet
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: **X:** 122.30866 **Y:** 47.52640

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-4

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started: 08/26/04 1300
Date/Time Completed: 08/26/04 1345
Equipment: Geoprobe
Drilling Company: Cascade Drilling
Drilling Foreman: Kasey Goble
Drilling Method: Geoprobe

Sampler Type: 4-foot sampler
Drive Hammer (lbs.): 140
Depth of Water ATD (ft bgs): 12
Total Boring Depth (ft bgs): 16
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL with sand trace silt. 85% fine-coarse gravel, 10% fine-coarse sand, and 5% silt. Brown, moist, no odor.			50	NA	NA	082604-1305-21	X	
		REFUSAL--Move one foot north and begin at two feet bgs. SAME as previous in new boring.			50	NA	NA	082604-1308-22	X	Well not installed
		SAME			40	NA	NA	082604-1312-23	X	
5					70	NA	NA	082604-1318-24	X	
					70	NA	NA	082604-1322-25	X	
10					80	NA	NA	082604-1326-26	X	
		FILL--wood debris. Strong creosote odor, shiny, black.			80	NA	NA	082604-1330-27	X	▼
		SAME as 4-11.5'						082604-1335-28		
		FILL--SAND minor silt. 90% fine sand, 10% silt. Brown, wet, apparent creosote odor observed.								
		FILL--SAND minor silt. 85% fine sand, 15% silt. Blue/grey, wet, strong petroleum odor, sheen observed on sand.			20	NA	NA	082604-1345-29	X	
15										
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 21 feet
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: X: 122.30853 Y: 47.52620

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-5

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	08/26/04 1415	**Sampler Type:**	4-foot sampler
Date/Time Completed:	08/26/04 1510	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	12
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Kasey Goble	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL minor sand, trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, 5% silt. Light brown, moist, no odor.			60	NA	NA	082604-1414-30	X	
		FILL-GRAVEL with sand, trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, 5% silt. Orangish brown, moist, no odor.			50	NA	NA	082604-1416-31	X	Well not installed
5					40	NA	NA	082604-1421-32	X	
					40	NA	NA	082604-1425-33	X	
					40	NA	NA	082604-1428-34	X	
10					50	NA	NA	082604-1455-35	X	
		REFUSAL move one foot north and begin at 10 feet bgs.			20	NA	NA	082604-1500-36	X	▼
		FILL--SAND minor gravel. 85% fine-coarse sand and 15% fine gravel. Brown, wet, no odor.			100	NA	NA	082604-1505-37	X	
15										
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 20-feet
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: X: 122.30836 Y: 47.52599

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-6

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	08/27/04 0845	**Sampler Type:**	4-foot sampler
Date/Time Completed:	08/27/04 0948	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	11.5
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Jaymen Lauer	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe - Limited Access		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		FILL--GRAVEL trace sand. 95% fine-coarse gravel and 5% sand. Brown, moist, no odor.			30	NA	NA	082704-0856-01	X	
					40	NA	NA	082704-0900-02	X	Well not installed
		SAME with white brick.			20	NA	NA	082704-0910-03	X	
5					100	NA	NA	082704-0915-04 082704-0920-05	X	
		FILL--SAND. 100% fine-coarse sand. Tan, dry, no odor, very hard.								
		FILL--GRAVEL with sand trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, and 5% silt. Brown, moist, no odor.			100	NA	NA	082704-0930-06	X	
		FILL--GRAVEL trace sand. 95% fine-coarse gravel, 5% fine-coarse sand. Black with obsidion like material, moist, no odor.								
10					100	NA	NA	082704-0935-07	X	▼
		FILL--SAME as 7.5-8. wet, some red brick.			80	NA	NA	082704-0940-08	X	
					50	NA	NA	082704-0942-09	X	
15		SAND trace silt. 95% fine sand and 5% silty. Grey, wet, no odor	SW							
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): Geoprobe
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 22
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: X: 122.30840 Y: 47.52576

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

Log of Boring: SB-7

Client: EMJ/Jorgensen Forge
Project: Jorgensen Forge
Location: Seattle, WA

Farallon PN: 831-003

Logged By: JAK and JAS

Date/Time Started:	08/27/04 1030	**Sampler Type:**	4-foot sampler
Date/Time Completed:	08/27/04 1120	**Drive Hammer (lbs.):**	140
Equipment:	Geoprobe	**Depth of Water ATD (ft bgs):**	13.5
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Jaymen Lauer	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Geoprobe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (units)	Sample ID	Sample Analyzed	Well Construction Details
0		8-inches of concrete	CO		50	NA	NA	082704-1032-10	X	
		FILL--GRAVEL with sand minor silt. 40% fine-coarse gravel, 40% coarse sand, 20% silt. Brown, moist, no odor			40	NA	NA	082704-1034-11	X	Well not installed
		SAME but 50% red brick.			20	NA	NA	082704-1038-12	X	
5		SAME no brick			20	NA	NA	082704-1044-13	X	
		FILL--GRAVEL with sand, trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, and 5% silt. Brown with orangish brown, moist, no odor. Metal debris.			60	NA	NA	082704-1054-14	X	
10		FILL--GRAVEL trace sand. 95% fine-coarse gravel and 5% fine-coarse sand. Brown, moist, no odor.			100	NA	NA	082704-1100-15	X	
		SAME as 6-8' interval. Brick throughout. Wet at 13.5			100	NA	NA	082704-1110-16	X	▼
15					20	NA	NA	082704-1115-17	X	
20										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): 25
Top of Casing Elevation (ft): NA
Boring Abandonment: Bentonite chips
Surveyed Location: X: 122.30826 Y: 47.52569